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1      <110> Ajinomoto Co., Inc.

5      <120> A method for improving the thermostability of a  
protein, a protein having improved thermostability and  
a nucleic acid sequence encoding the protein

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<150> JP 2000-201920

<151> 2000-07-04

<150> JP 2001-164332

<151> 2001-05-31

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<160> 104

<170> PatentIn Ver. 2.1

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B E D D O T T E R E S P G

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Ile Val Ser Lys Ser Lys Arg Ile Leu Ala Lys Ile Asn Glu Leu Tyr

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tct ttg cct atc gaa tat att gaa gta gaa gct ggt gat cgt gca ttg 144

Ser Leu Pro Ile Glu Tyr Ile Glu Val Glu Ala Gly Asp Arg Ala Leu

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gca aga tat ggt gaa gca ttg cca aaa gat agc tta aaa atc att gat 192

Ala Arg Tyr Gly Glu Ala Leu Pro Lys Asp Ser Leu Lys Ile Ile Asp

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5 gtt gtt gtc aag tta aga caa att tat gat atg tat gcc aat att aga 288  
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85 90 95

cca gca aag tct atc ccg gga ata gat act aaa tat ggt aat gtt gat 336  
Pro Ala Lys Ser Ile Pro Gly Ile Asp Thr Lys Tyr Gly Asn Val Asp  
100 105 110

ata ctt ata gtg aga gaa aat act gag gat tta tac aaa ggt ttt gaa 384  
Ile Leu Ile Val Arg Glu Asn Thr Glu Asp Leu Tyr Lys Gly Phe Glu  
115 120 125

cat att gtt tct gat gga gta gcc gtt ggc atg aaa atc ata act aga 432  
His Ile Val Ser Asp Gly Val Ala Val Gly Met Lys Ile Ile Thr Arg  
130 135 140

ttt gct tct gag aga ata gca aaa gta ggg cta aac ttt gca tta aga 480  
Phe Ala Ser Glu Arg Ile Ala Lys Val Gly Leu Asn Phe Ala Leu Arg  
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Arg Arg Lys Lys Val Thr Cys Val His Lys Ala Asn Val Met Arg Ile  
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Val Glu Tyr Ser Glu Met Tyr Val Asp Ala Ala Ala Asn Leu Val

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aga aat cct caa atg ttt gat gta att gta act gag aac gta tat gga    672  
Arg Asn Pro Gln Met Phe Asp Val Ile Val Thr Glu Asn Val Tyr Gly

210            215            220

gac att tta agt gac gaa gct agt caa att gcg ggt agt tta ggt ata    720  
Asp Ile Leu Ser Asp Glu Ala Ser Gln Ile Ala Gly Ser Leu Gly Ile

225            230            235            240

gca ccc tct gcg aat ata gga gat aaa aaa gct tta ttt gaa cca gta    768  
Ala Pro Ser Ala Asn Ile Gly Asp Lys Lys Ala Leu Phe Glu Pro Val

245            250            255

cac ggt gca gcg ttt gac att gct gga aag aat ata ggt aat ccc act    816  
20 His Gly Ala Ala Phe Asp Ile Ala Gly Lys Asn Ile Gly Asn Pro Thr

260            265            270

gca ttt tta ctt tct gta agt atg atg tat gaa aga atg tat gag cta    864  
Ala Phe Leu Leu Ser Val Ser Met Met Tyr Glu Arg Met Tyr Glu Leu

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tct aat gac gat aga tat ata aaa gct tca aga gct tta gaa aac gct    912  
Ser Asn Asp Asp Arg Tyr Ile Lys Ala Ser Arg Ala Leu Glu Asn Ala

290            295            300

ata tac tta gtc tac aaa gag aga aaa gcg tta acc cca gat gta ggt 960  
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305 310 315 320

5 ggt aat gcg aca act gat gac tta ata aat gaa att tat aat aag cta 1008  
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Lys Ala Asp Ile Ile Leu Lys Gly Pro Val Gly Glu Ser Ala Ala Asp

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Pro Ala Lys Ser Ile Pro Gly Ile Asp Thr Lys Tyr Gly Asn Val Asp

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Ile Leu Ile Val Arg Glu Asn Thr Glu Asp Leu Tyr Lys Gly Phe Glu

115 120 125

His Ile Val Ser Asp Gly Val Ala Val Gly Met Lys Ile Ile Thr Arg

130 135 140

Phe Ala Ser Glu Arg Ile Ala Lys Val Gly Leu Asn Phe Ala Leu Arg

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Arg Arg Lys Lys Val Thr Cys Val His Lys Ala Asn Val Met Arg Ile

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Thr Asp Gly Leu Phe Ala Glu Ala Cys Arg Ser Val Leu Lys Gly Lys

180 185 190

25 Val Glu Tyr Ser Glu Met Tyr Val Asp Ala Ala Ala Asn Leu Val

195 200 205

Arg Asn Pro Gln Met Phe Asp Val Ile Val Thr Glu Asn Val Tyr Gly

210 215 220

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Ala Pro Ser Ala Asn Ile Gly Asp Lys Lys Ala Leu Phe Glu Pro Val

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His Gly Ala Ala Phe Asp Ile Ala Gly Lys Asn Ile Gly Asn Pro Thr

260 265 270

Ala Phe Leu Leu Ser Val Ser Met Met Tyr Glu Arg Met Tyr Glu Leu

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Ser Asn Asp Asp Arg Tyr Ile Lys Ala Ser Arg Ala Leu Glu Asn Ala

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Ile Tyr Leu Val Tyr Lys Glu Arg Lys Ala Leu Thr Pro Asp Val Gly

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10

15

Ala Gly Leu Ile Gly Gly Leu Gly Val Thr Pro Ser Gly Asn Ile Gly

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25

30

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**<213> Bos taurus**

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Ala Ile Phe Glu Ala Val

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**<400> 101**

Val Ser Val Cys Pro Asn Leu Tyr Gly Asp Ile Leu Ser Asp Leu Asn

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Ser Gly Leu Ser Ala Gly Ser Leu Gly Leu Thr Pro Ser Ala Asn Ile

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20      Gly

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**<213> Saccharomyces cerevisiae**

**<400> 102**

**30 Ser Ile Phe Glu Ala Val**

*Sub A1*

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<400> 103

10 Val Ile Val Thr Pro Asn Leu Asn Gly Asp Tyr Ile Ser Asp Glu Ala  
1            5            10            15

Asn Ala Leu Val Gly Gly Ile Gly Met Ala Ala Gly Leu Asp Met Gly  
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<400> 104

Ala Val Ala Glu Pro Val  
1            5

25

73